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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/864,824	05/24/2001	Kuorong Chiang	9744	2390

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EXAMINER

WONG, LESLIE

ART UNIT	PAPER NUMBER
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2177

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DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/864,824

Applicant(s)

CHIANG, KUORONG

Examiner

Leslie Wong

Art Unit

2177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11 and 12 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's amendments to the abstract and drawings have overcome the Specification and Drawings rejections in Non Final Office Action dated 18 October 2003. The rejections are hereby withdrawn by the Examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5-7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Liu et al.** (U.S. Patent 6,263,331 B1) in view of **Paulley** (U.S. Patent 6,516,310).

Regarding claims 1, 5, 9, and 10, **Liu et al.** teach a method for joining an inner table and an outer table in a database in response to a query statement having an inclusion operator, said method comprising:

- a). providing an inner table (Fig. 6, element 601);
- b). providing an outer table having zero or more records for inclusion with said inner table (Fig. 6, element 601);

Although **Liu et al.** do not clearly state that the outer table having records for inclusion. However, it indicates that the system determines which rows in the outer tables **satisfy a selection criteria** (i.e., all criteria). Since inclusion or exclusion operator (i.e., IN and not IN) is one of the user selection criteria, **Liu et al.** therefore teaches the inclusion criteria.

- d). creating a hash table from said left table (col. 10, lines 39-42);
 - e). obtaining a hash value from said right table (col. 9, lines 48-52);
 - f). probing said hash table with a said hash value from said right table to determine if said hash value matches a value in said hash table (col. 10, lines 43-46); and
 - g). if said outer hash value matches said value in said hash table, then evaluating the actual values and, if the join condition is satisfied, including said row of said outer table in a result (col. 10, lines 47-48).
- c). **Liu et al.** do not clearly teach the step of transposing said outer table and said inner table to form a right table and a left table, respectively;

Pualley, however, teaches swapping the left outer joins and right outer joins to determine the best-cost strategy for the query (col. 18, lines 8-12). Examiner submits that swapping the joins to place them at their best positions is equivalent to transposing the inner and outer tables, since they solve the similar problem which is optimizing the query in order to save processing costs and increase the performance.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to transpose the inner table and outer table to place the tables in

the their best positions in order to save the processing costs for the queries and to increase system performance.

Regarding claims 2 and 6, **Liu et al.** further teach wherein scanning said inner table is accomplished one row at a time per processor (col. 9, lines 1-3).

Regarding claims 3 and 7, **Liu et al.** further teach wherein said step of obtaining a hash value from said right table includes calculating a hash value (col. 9, lines 48-50).

4. Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Liu et al.** (U.S. Patent 6,263,331 B1) in view of **Paulley** (U.S. Patent 6,516,310) as applied to claims 1-3, 5-7, 9, and 10 above, and further in view of **Bestgen et al.** (U.S. Patent 6,134,546).

Regarding claims 4 and 8, **Liu et al.** do not explicitly teach wherein said step of obtaining a hash value from said right table includes retrieving a pre-calculated hash value from a row header.

Bestgen et al., however, teach a Hash table structure includes a header pointing to a root page including multiple pointers to buckets for hash values (Fig. 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the hash values in the header as this would expedite the process of obtaining the hash values for evaluating selection criteria.

Allowable Subject Matter

5. Claims 11 and 12 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Prior art of record fails to teach a combination of elements including capability to recognize an inclusion merge join and replace with said inclusion hash join having an inner table and an outer table, wherein said inner table and said outer table are assigned as a left table and a right table, respectively, and said left table is hashed into a hash table and hash values from said right table are used to probe said hash table to determine if an inclusion condition is satisfied for a row of said right table.

Response to Argument

6. Applicant's arguments filed 27 February 2004 have been fully considered but they are not persuasive.

Applicant argues that Liu does not provide an inner table or an outer table as disclosed in claims 1, 5, 9, and 10. Liu teaches a smaller one of the two tables is designated as an outer table and a larger of the two tables as an inner table. Therefore, neither Liu nor Paulley disclose or hint at an inner table associated with an inclusion operation, an exclusion operator, an in inclusion join candidate, or an exclusion join

candidate as required the above claimed limitations. In response to the preceding arguments, Examiner respectfully submits that Applicant admitted at page ~~3~~⁴, paragraph 4th that Liu does teach the smaller table is the outer table and the larger table is the inner table (col. 5, lines 66-67). Liu further teaches that the hybrid hash join process determines which rows in the inner and outer tables satisfy a *selection criteria* (col. 6, lines 1-3). For instance, the selection criteria could be "select city, country from location where city IN (select city from major-cities)". This query would only return rows that contain cities from major-cities table as specified by the inclusion clause. As a result, the query excludes all other cities. Therefore, Liu's teaching regarding determining which rows of the inner table and outer table satisfy the selection criteria reads on the inclusion or exclusion aspect of the claimed limitations.

Applicant further argues that Paulley discusses a method where, right outer joins are rewritten as left outer by swapping the two inputs. Paulley does not disclose or hint at transposing the outer and inner table to form a right table and a left table in response to a query statement having an inclusion operator, as required by claim 1, an inclusion join candidates as required by claim 9, an exclusion operator, as required by claim 5, or an exclusion join candidate as required by claim 10. In response to the preceding arguments, Examiner respectfully submits that applicant admitted that Paulley teaches the right outer joins are rewritten as left outer by swapping the two inputs (col. 18, lines 7-9). Examiner submits that terms such as swap or exchange or interchange or reverse have equivalent meanings as transpose, transposes, or transposing. Therefore, the

Art Unit: 2177

prior art does not have to recite the exact terminology as those in the applicant's claims in order to convey the same meaning. As discussed above Liu teaches limitations regarding an inner table and an outer table for performing an inclusion or exclusion search criteria. Liu does not explicitly teach the step of transposing the inner and outer table as claimed. Paulley was brought in to complement the missing feature by swapping or transposing the two tables - the right outer join and left outer join (col. 18, lines 7-9). Thus, combining the references would have arrived at the claimed limitation.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

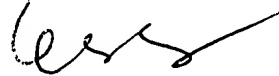
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leslie Wong whose telephone number is (703) 305-3018. The examiner can normally be reached on Monday to Friday 9:30am - 6:30 pm.

Art Unit: 2177

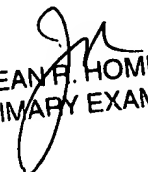
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (703) 305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Leslie Wong
Patent Examiner
Art Unit 2177

LW
May 4, 2004



JEANNE HOMERE
PRIMARY EXAMINER